

## CLAIMS

What is claimed is:

1. A structure of LED illuminating apparatus, comprising:  
a plurality of LED modules; and  
5 a cubical prism surrounded by said plurality of LED modules, arranged to integrate lights emitted from said plurality of LED modules.
2. The structure of LED illuminating apparatus according to claim 1, wherein said plurality of LED modules comprise a red LED module, a green  
10 LED module, and a blue LED module.
3. The structure of LED illuminating apparatus according to claim 2, wherein said red LED module comprises a red LED array and a corresponding condense lens, said condense lens is arranged between said red LED array and said  
15 cubical prism.
4. The structure of LED illuminating apparatus according to claim 2, wherein said green LED module comprises a green LED array and a corresponding condense lens, said condense lens is arranged between said green LED array and  
20 said cubical prism.
5. The structure of LED illuminating apparatus according to claim 2, wherein said blue LED module comprises a blue LED array and a corresponding condense lens, said condense lens is arranged between said blue LED array and  
25 said cubical prism.
6. The structure of LED illuminating apparatus according to claim 1 further

comprising a lens module, arranged on a light outgoing side of said cubical prism.

7. The structure of LED illuminating apparatus according to claim 6 further comprising an optical integrator, arranged on a light outgoing side of said lens module.

8. The structure of LED illuminating apparatus according to claim 7, wherein said optical integrator comprise a first lens array and a second lens array.

9. The structure of LED illuminating apparatus according to claim 7 further comprising a polarization conversion system on a light outgoing side of said optical integrator.

10. A structure of projector with an LED illuminating apparatus, comprising:  
a plurality of LED modules as a light source;  
a plurality of LCD light valve panels, arranged to modulate lights emitted from said corresponding LED modules;  
a cubical prism surrounded by said plurality of LCD light valve panels, arranged to integrate modulated lights transmitted from said plurality of LCD light valve panels; and  
a lens module, arranged on a light outgoing side of said cubical prism.

11. The structure of projector with an LED illuminating apparatus according to claim 10, wherein said plurality of LED modules comprise a red LED module, a green LED module, and a blue LED module.

12. The structure of projector with an LED illuminating apparatus according to claim 11, wherein said red LED module comprises a red LED array and a corresponding condense lens, said condense lens is arranged between said red LED array and said corresponding LCD light valve panel.

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13. The structure of projector with an LED illuminating apparatus according to claim 11, wherein said green LED module comprises a green LED array and a corresponding condense lens, said condense lens is arranged between said green LED array and said corresponding LCD light valve panel.

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14. The structure of projector with an LED illuminating apparatus according to claim 11, wherein said blue LED module comprises a blue LED array and a corresponding condense lens, said condense lens is arranged between said blue LED array and said corresponding LCD light valve panel.

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15. The structure of projector with an LED illuminating apparatus according to claim 10 further comprising an optical integrator, arranged on a light outgoing side of said lens module.

20 16. The structure of projector with an LED illuminating apparatus according to claim 15, wherein said optical integrator comprises a first lens array and a second lens array.

25 17. The structure of projector with an LED illuminating apparatus according to claim 15 further comprising a polarization conversion system on a light outgoing side of said optical integrator, arranged to raise the light utilization efficiency and project a color image to a projection screen.

18. A structure of projector with an LED illuminating apparatus, comprising:

a plurality of LED modules as a light source;

a plurality of LCOS light valve panels, arranged to modulate lights emitted

5 from said corresponding LED modules;

a plurality of polarizing beam splitters, arranged to direct unmodulated lights emitted from said corresponding LED modules enter said corresponding of LCOS light valve panels;

a cubical prism surrounded by said plurality of polarizing beam splitters,  
10 arranged to integrate the modulated lights transmitted from said plurality of polarizing beam splitters; and

a lens module, arranged on a light outgoing side of said cubical prism.

19. The structure of projector with an LED illuminating apparatus according to

15 claim 18, wherein said plurality of LED modules comprise a red LED module, a green LED module, and a blue LED module.

20. The structure of projector with an LED illuminating apparatus according to claim 19, wherein said red LED module comprises a red LED array and a

20 corresponding condense lens, said condense lens is arranged between said red LED array and said corresponding polarizing beam splitter.

21. The structure of projector with an LED illuminating apparatus according to claim 19, wherein said green LED module comprises a green LED array and a

25 corresponding condense lens, said condense lens is arranged between said green LED array and said corresponding polarizing beam splitter.

22. The structure of projector with an LED illuminating apparatus according to claim 19, wherein said blue LED module comprises a blue LED array and a corresponding condense lens, said condense lens is arranged between said blue LED array and said corresponding polarizing beam splitter.

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23. The structure of projector with an LED illuminating apparatus according to claim 18 further comprising an optical integrator, arranged on a light outgoing side of said lens module.

10 24. The structure of projector with an LED illuminating apparatus according to claim 23, wherein said optical integrator comprises a first lens array and a second lens array.

15 25. The structure of projector with an LED illuminating apparatus s according to claim 23 further comprising a polarization conversion system on a light outgoing side of said optical integrator, arranged to raise the light utilization efficiency and project a color image to a projection screen.